

Assessing Integrated Language and Content Instruction

DEBORAH J. SHORT
Center for Applied Linguistics

Integrated language and content instruction has become a popular alternative to traditional ESL instruction. Researchers have recommended this instructional approach to develop students' academic language ability and facilitate their transition to mainstream classes. Practitioners have also favored this approach for several reasons: to prepare students for mainstream classes, increase student motivation and interest with content themes, and make ESL students feel part of the mainstream school curricula. Over the past 10 years, much progress has been made in developing, implementing, and refining strategies and techniques that effectively integrate language and content instruction. However, the issue of assessment is still being resolved. Neither traditional language tests nor content achievement tests are adequate. The difficulty with assessment centers on isolating the language features from the content objectives so one does not adversely influence the other. This article addresses the issue of assessment in integrated classes and provides a framework for organizing assessment objectives. It recommends using alternative assessment measures, such as checklists, portfolios, interviews, and performance-based tasks. Examples of the framework being implemented in elementary and secondary school integrated language and content classes are also included.

The integration of language and content instruction has come of age. No longer the new trend in methodologies, content ESL-- or sheltered English, or language sensitive content instruction as it is variously known--has assumed a valued and dynamic place in many school curricula. Language teachers have forged common ground with subject-area educators in implementing content-based syllabi. These educators recognize that although the need to prepare language minority students for a rigorous academic program is great, in many school settings, the time for such preparation is brief.

The demographic picture in the U.S. is revealing. The fastest growing sector of the school population comprises language minority students. Within the language minority student body, the underschooled group is the fastest growing. Educators can no longer rely on transfer of knowledge and skills as students learn English and then enter a mainstream track because so many students come to U.S. schools underprepared for the required grade-level work. In response, language and subject-area educators have been joining forces to get language minority students involved in the regular curricula before they have fully mastered the English language. There simply is no time to delay academic instruction until these students have developed high levels of English language proficiency if they are to stay in school, succeed in their classes, and graduate

with a high school diploma. In a recent report, the Council of Chief State School Officers (CCSSO, 1992) notes: "For limited English proficient (LEP) students success in school hinges upon gaining access to effective second language learning opportunities, and to a full educational program" (p. 4). The report goes on to say that whereas language assistance programs help in developing English proficiency, they should, at the same time, "ensure that these students continue to learn and expand their knowledge of new content and therefore do not fall behind peers whose native language is English" (p. 6).

In many U.S. schools, bilingual education programs have been perceived as the answer to keeping students on grade level for content objectives while developing enough language proficiency for students to be mainstreamed eventually. Unfortunately, this ideal is rarely fulfilled in bilingual programs for several reasons. First, most of the programs are "early exit." Students exit the program after 2 years, often on the basis of oral proficiency tests, before they have the academic language skills needed to master the demands of the regular classroom. (See Cummins, 1980a, and Collier, 1989, for a fuller discussion.) Second, bilingual programs are found primarily in the elementary schools, leaving secondary-aged students without that form of native language support. Third, a bilingual approach is not feasible in schools where the LEP students speak many different native languages. In these last two situations, students are often placed in ESL programs. However, traditional ESL programs, where the focus is on language development with little attention to subject area curricula, are not serving the current influx of language minority students well.

As a consequence, the integration of language and content objectives in lesson plans has been implemented and accepted by a wide range of teachers and administrators as one solution to the dilemma of how to teach English to linguistically and culturally diverse students while preparing them for grade level curricula. A number of teacher resource manuals and student textbooks have been written to guide instruction in this approach.⁽¹⁾ Preservice and in-service training have increasingly focused on the integration of language and content around the country. Journal articles and conference presentations abound. The U.S. Department of Education is sponsoring a national study, which, in its first phase, collected data from more than 1,500 programs in the U.S. that have an integrated language and content program in one school or more (Center for Applied Linguistics, 1993). The overall goal of the study will be to describe the range of practices for content ESL and identify key program features that produce effective educational results.

In content-based language instruction, language teachers use content topics, rather than grammar rules or vocabulary lists, as the scaffolding for instruction. Frequently, language teachers collaborate with content-area colleagues to plan instruction that complements and/ or reinforces instruction occurring in the regular content course. In language-sensitive content instruction, such as in sheltered science, content teachers have been trained in ESL techniques, enabling them to adjust their instruction to meet the needs of language minority students. These techniques include increased use of visuals and demonstrations, emphasis on graphic organizers and thinking/study skill development, and promotion of student participation and communication through all four language skills listening, speaking, reading, and writing. Moreover, most language and content teachers are using cooperative grouping, thereby enabling language minority students to access additional support from their peers. By providing students opportunities to use language in meaningful contexts--studying the academic subject matter while they develop language proficiency--teachers create an ideal learning environment for facilitating the transition of these students into mainstream courses.

How to teach academic content has been the first barrier to cross in order to improve educational practice for language minority students, but a second remains--how to assess student comprehension of subject matter and student language skill development. Students and teachers realize that most assessment instruments actually test both content concepts and language ability, particularly reading comprehension and

writing. Because language and content are intricately intertwined, it is difficult to isolate one feature from the other in the assessment process. Thus, teachers may not be sure whether a student is simply unable to demonstrate knowledge because of a language barrier or whether, indeed, the student does not know the content material being assessed. Yet, a distinction needs to be drawn, especially if a student is not succeeding in a course. This article will address the second barrier by providing a framework for teachers to use as they measure students' content mastery and language skill and seek to determine whether content objectives have not been mastered or whether language is interfering with a student's acquisition and application of information.

ASSESSMENT REFORM

At present, assessment dominates the educational reform dialogue. Inadequacies in current practices have led many educators and observers of educational progress in the U.S. to call for changes in assessment procedures. (See, e.g., Linn & Baker, 1992; NCEST, 1992; NCRMSE, 1991.) The emphasis on assessment reform comes from many fronts: teachers, administrators, government officials and politicians, researchers, education consultants, and business leaders. At the local level, it is tied to accountability, program evaluation, programmatic support, community support, student achievement, student promotion, and credibility. Beyond the school district boundaries, it is linked to college entrance requirements, the national standards movement, and workplace skills. It affects teacher and administrator careers, public funding of programs, school choice, and more.

There are several reasons to assess student learning in the classroom: to place students in classes, to measure student progress and achievement, to guide and improve instruction, and to diagnose student knowledge of a topic before it is taught. Such assessment must be carried out carefully. Educators now acknowledge that standardized tests with short answer or multiple-choice items do not provide an accurate picture of student knowledge as a whole (Ascher, 1990; CCSSO, 1992; MSEB, 1991); therefore, it is inappropriate to base placement, achievement levels, and instructional plans solely on standardized test results. In addition, a task force commissioned by the National Center for Research on Evaluation, Standards and Student Testing (NCRESST, 1992) has recognized that student diversity and educational equity play a role in test performance. In the monograph it is preparing, the task force plans to recommend nonstandardized, alternative assessment approaches for measuring student ability. Although school systems will continue to use standardized tests to measure and compare student progress, alternative assessment must also become part of the student evaluation package.

The demand for assessment alternatives to paper-and-pen multiple-choice tests has grown among language and content educators who want more accurate measures of their students' knowledge. For some educators, alternative measures may simply entail incorporating open-ended questions and essays into existing tests. For others, alternative assessment would be organized to permit students to demonstrate their knowledge and abilities over a long period of time, as through portfolios. Still others look at authentic assessment as the solution- requiring students to conduct tasks that mirror the use of the concept or operation or manipulative (e.g., microscopes, geoboards, or fraction bars) in the real world.

The charge to revise curriculum and evaluation practices in the U.S. began with the publication of *Curriculum and Evaluation Standards for School Mathematics* by the National Council of Teachers of Mathematics (NCTM, 1989). In these standards, NCTM recommended that students be taught to communicate mathematically and called for a new way of thinking about assessing mathematics, including making assessment integral to instruction and using multiple measures to evaluate student learning. Lajoie

(1991) offered several ideas and principles for designing authentic assessment tasks that conform to the new standards. In 1992, NCTM devoted an issue of *Arithmetic Teacher* (NCTM, 1992b) and of *Mathematics Teacher* (NCTM, 1992a) to alternative assessment with articles describing assessment trends, classroom strategies, and grading procedures. In addition, NCTM has recently begun developing assessment standards to be published in a separate volume to accompany the organization's standards publications.

Other subject-area professional organizations have taken up the charge and are in the process of revising their assessment practices, many calling for more performance-based measures. A case in point is the National Science Teachers Association's (NSTA) Scope, Sequence and Coordination of Secondary School Science project. As the informational brochure explains:

The assessment will require students to demonstrate why they believe something, how they know something is correct, and what terms mean, using real objects and phenomena. (NSTA, no date)

The National Research Council is also looking at science assessment and has established the National Committee on Science Education Standards and Assessment to work on national standards for science that "guide judgments about and the development of science curriculum, teaching and assessment" (NSTA, 1992, p. 3).

The National Council for the Social Studies (NCSS), like NCTM, devoted a special section of its journal, *Social Education* (NCSS, 1992), to assessment. Articles addressed issues of testing and teacher involvement with alternative measures such as performance tasks and portfolios. In his book, Parker (1991) advocated authentic assessment in social studies education that corresponds to instructional activities, requires higher order thinking, and sets out performance based criteria that define the levels of student knowledge.

Assessment reform has not been unheralded among language educators either. With the introduction of a whole language perspective into elementary classrooms, assessment of student progress has been reconsidered. No longer could traditional spelling tests, for example, serve their familiar function in a classroom where *intended* spelling was the norm.⁽²⁾ In fact, the use of portfolio assessment in K 12 language arts classes has its origins in the whole language movement (Harp, 1991; Tierney, 1991) With portfolios (as this article discusses below), students exhibit their writing progress and proficiency through meaningful and contextual activities that they have selected and compiled.

ESL and bilingual educators have had to attend to a wider range of assessment practices than most other classroom teachers. Besides measuring student achievement within the course, assessment has always played a gatekeeping role in deciding which students would be placed in which class and, later, when a student would exit from that class. In the not too distant past, students frequently entered and exited ESL/bilingual (BE) education programs on the basis of their oral language proficiency test scores. Over time, however, we have learned that these tests are imprecise measures of students' ability to do grade level subject-matter work in a nonnative language (see Cummins, 1980b). Many former ESL/BE students who passed these tests were not ready for the academic language tasks (e.g., expository reading and writing assignments) required in mainstream classes, and they did not succeed. One common solution was to place these students in the lowest track courses. Some students' solution was to drop out. Neither solution solved the problem of students being underprepared for the academic rigors of the mainstream curriculum. This realization gave impetus to ESL and bilingual teachers to use content-based language instruction and subsequently to recognize the need for additional assessment instruments more commensurate with the academic demands of the mainstream curricula.

Further support for assessment reform has come from U.S. business and industry reports of deficiencies in the skills of the workforce (see Johnston & Packer, 1987). Once students move into the workplace, they discover the need for communication skills in the context of writing, reading, and social tasks and for document and quantitative literacy skills such as interpreting graphs and schedules, or performing accounting procedures and balancing budgets, respectively. The instructional and assessment practices many of these students experienced in school have not corresponded well to the application of their knowledge in the work setting. Seeking to employ a better prepared workforce, the business sector has called for educational improvements including the incorporation of alternative or authentic assessment into an overall policy (Berryman & Bailey, 1992; Secretary's Commission on Achieving Necessary Skills, 1991). In one response, the American College Testing program is working on a "skills assessment tool to link school instruction with workplace needs" (AAAS, 1991, p. 1). This assessment tool considers the academic skills of reading, writing, and computation along with workplace skills such as problem solving, reasoning, teamwork, and oral communication.

ASSESSING THE INTEGRATION OF LANGUAGE AND CONTENT

Government, school, and business sectors in the U.S. have joined in their support for assessment reform. Alternative assessment, in its diverse formats, has become the trend. Most educators are experimenting with it in some form in their classrooms. Some states, such as Vermont and California, are mandating it for all students. (See Blank & Dalkilic, 1992, for a review of state policies.) Parents are becoming informed about alternative assessment; students are responding positively to it. As assessment increasingly reflects instruction that is occurring in the classroom, teaching to the test has been deemphasized. Good assessment is recognized as that which reflects actual classroom practices, not a one-time standardized exam.

The many varieties of alternative assessment include performance based tests, portfolios, journals, projects, and observation checklists. Although these measures allow better demonstration of student knowledge, they can nonetheless confound teachers of language minority students. Complications arise first because teachers must determine whether the language or the content is being assessed in these alternative measures. Then teachers must distinguish between the language and content knowledge of the students and decide if one is interfering with the demonstration of the other.

For instance, students who can solve math computation problems correctly and thereby demonstrate mastery of mathematical operations may be unable to solve a math word problem requiring the same computations if their English proficiency is not at a level capable of understanding the words and assumptions in the problem. Conversely, students who can write a well-constructed essay about their country's agricultural practices and thereby demonstrate mastery of paragraph development with topic sentences and supporting details may be unable to write an essay on the decline of the U.S. automobile industry if the topic, its relevant vocabulary, and notable people and events are unfamiliar.

Clearly, educators of language minority students grapple with this dilemma every day. As a result, one strong recommendation has emerged: Objectives should be defined before designing or choosing any instructional procedure, ranging from a lesson plan to an exam. Although it is not uncommon to find teachers assigning two grades to a writing sample such as an essay--one for form (e.g., grammar, vocabulary, spelling, topic sentences) and one for content (e.g., topical, accurate, interesting)--this practice does not work for all subject areas or testing situations. Instead, it is more advisable to focus on a single objective, be it content or language specific. Some assessment tools can be used exclusively for checking content comprehension, whereas others can be designated as language development measures. A word of

caution is in order: Even within a language assessment instrument, teachers must make a choice whether to measure fluency or accuracy.

A second recommendation from field experience concerns flexibility. School systems should include both formal and informal measures in their overall assessment plan and must support teachers who develop and implement a diverse repertoire of assessment tools. Although all students can benefit from a wide range of assessment procedures, variety is particularly important for language minority students because they (a) are often unfamiliar with the type of standardized tests usually required in U.S. schools, (b) may have different learning and testing styles, and (c) may be unable to demonstrate the extent of their knowledge at a single sitting on one designated testing day. Further, particularly in the case of standardized tests, language minority students should be given more time for completion because they must process both language and content information embedded in the test.

The remainder of this paper proposes an assessment framework with the underlying philosophy that alternative measures should be incorporated into lesson planning frequently and informally as a significant part of instruction. Successful implementation of the framework requires that (a) students be given frequent opportunities to demonstrate the growth of their knowledge base; (b) assessment tools be varied to meet individual learning styles, needs, and current skill levels; and (c) students be made aware of the assessment objectives in advance. (There may be times when an educator wishes to prepare a test in a more formal manner to compare the achievement of students receiving content-based instruction with those receiving traditional ESL instruction; e.g., see the systematic discussion of content-based language test design by Turner, 1992.)

AN ASSESSMENT MATRIX

Overall, assessment should be viewed holistically but in an integrated language and content course, where students are asked to demonstrate knowledge and ability in several areas, it is important to separate language issues from subject area concepts. The following matrix (Figure 1) is offered to language and content educators as a guide for selecting their assessment tool and for determining in advance their assessment objective: language or content. (Some of the categories have been derived from work conducted by the author and colleagues at the Center for Applied Linguistics, from Griffiths & Clyne, and from work by Kessler & Quinn, 1992.) This matrix examines what might be assessed and how the assessment might be done. It is a first step in distinguishing between these two categories of learning for a language minority student.

The objectives of an integrated language and content course can be divided into the following categories: problem solving, content-area skills, concept comprehension, language use, communication skills, individual behavior, group behavior, and attitude. These areas can then be assessed through some of the following alternative measures: skill checklists and reading/writing inventories, anecdotal records and teacher observations, student self-evaluations, portfolios, performance-based tasks, essay writing, oral reports, and interviews.

Some overlap will occur between the language and content distinctions when some of the objectives, such as certain problem solving activities, require that language (oral or written) be demonstrated. If students solve a mixture problem in algebra but are asked to explain and justify the steps taken, language is required to do so. They must recall the vocabulary terms, articulate coherent sentences, and make use of transition markers such as then and next. The overlap can be clarified, however, by varying the assessment alternatives and categorizing the objective areas for assessment, as the divisions in Figure I show. The key is to select the

type or types of assessment carefully and to focus consistently on the objective. For instance, by looking at the process a student undertakes when solving a problem through anecdotal records kept during class, a teacher can note that the student made estimations before seeking a solution and checked the work before turning it in. When checking on language use, the teacher may have the student report orally on a solved problem and listen for appropriate use of technical terms.

FIGURE 1
Integrated Language and Content Assessment: What and How

H O W

| | Check list, inventory | Anecdotal record, teacher obser vation | Student self evaluation | Portfolios | Performa nce, manip ulativ es | Written essays, reports | Oral reports | Student interviews |
|--------------------------|-----------------------------|--|-------------------------------|------------|--|----------------------------|-----------------|-----------------------|
| Problem solving | | | | | | | | |
| Content area skills | | | | | | | | |
| Concept comprehension | | | | | | | | |
| Language use | | | | | | | | |
| W Communication | | | | | | | | |
| H skills | | | | | | | | |
| A Individual | | | | | | | | |
| T behavior | | | | | | | | |
| Group behavior | | | | | | | | |
| Attitudes | | | | | | | | |

The matrix also distinguishes between individual and group work. As indicated earlier, content and language teachers often engage students in cooperative activities, and this practice benefits language minority students. However, all students must also be able to complete tasks individually. When language minority students are placed in mainstream classes, they will be expected to work on group and individual assignments; thus, assessing their preparation in these areas is important.

The final category of the matrix considers student attitude toward content subjects. Determining a student's attitude toward a subject can be enlightening for a teacher in terms of selecting curricula and promoting student participation. There is ample anecdotal evidence that if students like a subject and/or recognize its importance, they will be motivated to work hard and perhaps be more successful in that course.

SKILLS ASSESSED

The skill categories shown in the matrix in Figure 1 are as follows.

Problem Solving

Within this category, students show the ability to solve problems. Examples include drawing diagrams, sorting and classifying, using manipulatives as models, explaining to other students, finding/accepting alternate solutions, designing one's own problems, checking one's work.

Content-Area Skills

Here, students demonstrate content skills. Examples include adding mixed numerals, graphing points on x- and y-axes, simplifying algebraic expressions, creating a timeline, following directions on a map, balancing a chemical reaction equation, identifying elements of a cell.

Concept Comprehension

Students show understanding of content concepts and when and where to apply this knowledge. Examples include determining whether to use multiplication or addition, distinguishing between area and perimeter, representing information graphically, recognizing patterns, comparing the monetary systems of two ancient civilizations, arranging organisms into a food chain.

Language Use

Students are assessed on their ability to use academic language appropriately. Examples include using correct technical vocabulary; recognizing similar terms such as decrease, diminish, and minus; writing a paragraph with a topic sentence and supporting details.

Communication Skills

Students must convey information or opinions about the work done or the subject area studied. Examples include the ability to explain steps taken in an experiment, sharing ideas, discussing math concepts, debating health issues, giving and justifying opinions.

Individual Behavior

Students conduct and complete work individually. Examples include planning and carrying through an assignment, researching a topic and preparing a report on it, exhibiting self-motivation, discipline, and independence.

Group Behavior

Students demonstrate successful communicative and social skills and complete group tasks. Examples include working collaboratively with other students in a group, contributing to the discussion, explaining to others, using social skills.

Attitude

Teachers can assess student attitude toward the subject. Examples include being comfortable doing content work, exhibiting confidence, showing a willingness to take risks, recognizing the relevance of a content area in one's life. If the attitude is negative, teachers may want to modify their instructional approach.

ASSESSMENT MEASURES

Many of the alternative assessment measures of this matrix have been described in detail elsewhere. (See ASCD, 1992; Hamayan & Pflieger, 1987; Pierce & O'Malley, 1992, and Short, 1991) In this article, they will be briefly explained, noting some advantages and disadvantages. It is important to recognize that this list is not exhaustive but representative of teacher options that take into account student skill levels, learning styles, and presentation modes.

Skill and Concept Checklist, Reading and Writing Inventories

A teacher can use a checklist or an inventory during the lesson as students are working and mark off skills students demonstrate. The checklist could also be used after the lesson, upon reflection, or based on student work that has been turned in.

Advantages

This quick measure can be completed while walking around during individual or cooperative learning activities. It helps meet some curricular objectives, such as covering grammar items, within the context of a communicative, content-based lesson where items appear in context, not as discrete variables

Disadvantages

Because this is often a yes-or-no measure, the student demonstrates the skill or doesn't; it is hard to show student progress for a specific skill. This limitation could be overcome by defining three increments such as *unable*, *making progress*, and *mastery* of a skill or concept.

Anecdotal Record, Teacher Observations

A teacher may reflect on a student's work or behavior during the day or over a short period of time and record impressions and anecdotes that pertain to the student's learning progress.

Advantages

Such records and observations help capture the learning process vividly; they can be an insightful commentary on student progress.

Disadvantages

This measure may not satisfy the requirements of accountability. Anecdotal records are not always considered valid evidence of student progress and achievement. Moreover, such observational records take time but need to [be] done regularly.

Student Self-Evaluation

Students may evaluate a specific piece of their own work or judge their learning progress using a checklist, scale, or written description.

Advantages

Self-evaluations offer students opportunities for reflection. Moreover, they encourage students to take responsibility for assessment.

Disadvantages

Once again, the question of accountability is raised. Self-report data are not always considered valid measures. Also, students may need to be trained to judge their own work and that of classmates.

Portfolios

Students, sometimes with teacher, peer, or parental assistance, are given the responsibility to select a variety of work products and arrange them in a portfolio that demonstrates their knowledge growth. Students are often asked to justify their selections.

Advantages

Portfolios allow students to demonstrate progress over time. As such, they encourage student participation and accountability. An additional advantage is that they can be assembled according to specifications such as "include a first draft and final copy of a report" and "include something you think was not done well and explain how you could improve it."

Disadvantages

Developing and evaluating portfolios is time-consuming; they do not provide a quick picture of student knowledge. Another drawback for some is that scoring is subjective and teachers need training in how to score consistently.

Performance-Based Tasks, Manipulatives

It should be noted that some educators use the term performance assessment to include all activities that assess skills contextually. Some also use performance interchangeably with authentic and alternative assessment. For the purposes of this article, performance has this more limited, task-based definition. In this measure, students must perform an assigned task, such as setting up equipment for a science experiment, miming the events in a story, following oral or written directions. This type of assessment often involves physical movement and manipulatives.

Advantages

These tasks help students with low literacy skills. As well, they meet the needs of tactile and kinesthetic learners; assessment is process oriented.

Disadvantages

This kind of assessment is time-consuming; students must be assessed individually or in small groups, and scoring may be subjective.

Written Essays, Reports, and Projects

Students present their knowledge pictorially or in writing through essays, research reports, or long-term projects.

Advantages

These measures give students time to prepare. They may also allow for different modes of presentation (written or pictorial). Essays, reports, and projects are suitable for group work.

Disadvantages

Research may require high literacy skills in reading and writing. It is also time consuming.

Oral Reports and Presentations

Students report and present orally knowledge they have acquired.

Advantages

Oral presentations give students time to prepare in advance. They allow low literacy-level students to participate in assessment and are suitable for group work.

Disadvantages

Some students are uncomfortable with public speaking. Again, oral assessment is time-consuming.

Interviews

A teacher may conduct an individual or group interview to ascertain student knowledge or attitude.

Advantages

Interviews give teachers opportunities to probe student knowledge or rephrase questions; they provide students with a chance to ask and clarify questions. Interviews do not require high literacy skills.

Disadvantages

It is time-consuming to interview each student individually. As well, interviews require oral comprehension and production skills.

ASSESSMENT ACTIVITIES

At this point, it may be useful to demonstrate the use of this matrix by describing some activities that might occur in several cells. For illustrative purposes, various subject areas and classes found in the U.S. school system are represented. Figure 2 indicates which cells will be discussed.

1. Problem Solving: Anecdotal Record

Objective: To determine if students make use of problem-solving techniques

In an integrated language and mathematics class, the teacher has asked students to solve some word problems. As the teacher walks around the room, s/he notes that some of the students are drawing diagrams as they work out their solutions. The teacher records in a notebook students who try several diagrams, those who compare diagrams with others, and those who do not draw diagrams.

FIGURE 2
Integrated Language and Content Assessment: What and How

| | | H O W | | | | | | | |
|------------------|--------------------------|-----------------------------|--|-------------------------------|------------|---|-------------------------------|------|-----------------------|
| | | Check list, inventory | Anecdotal record, teacher obser vation | Student self evaluation | Portfolios | Performa nce, manip ulativ es | Written essays, reports | Oral | Student interviews |
| W H A T | Problem solving | | 1 | | | | 2 | | 3 |
| | Content area skills | 4 | | 5 | | | | | |
| | Concept comprehension | | | | 6 | 7 | | | |
| | Language use | | | | | | | 9 | |
| | Communication skills | | | | 10 | | 11 | | |
| | Individual behavior | | 12 | | 13 | | | | |
| | Group behavior | | | 14 | | | | 15 | |
| | Attitudes | 16 | | | | | | | 17 |

2. Problem Solving: Essays, Reports

Objective: To evaluate student ability to analyze and describe problem solving processes

Students are shown an algebraic word problem and two correct but different solutions written by other students. They are asked to write an essay describing the steps each student took to generate their solution to the problem. Then they are shown a third student's solution which resulted in an incorrect solution and are asked to explain where and how that student erred.

3. Problem Solving: Interview

Objective: To have students reflect metacognitively on steps taken to solve a health problem

In an integrated language and health class, the teacher has set up the following scenario.

A village in India uses a common well as its source of drinking water. The water has become polluted and villagers are getting sick. You students are the scientists given the task of determining the source of the pollution.

The teacher allows students to discuss the problem in groups and then interviews several students individually. During the interview, the teacher asks the students what hypotheses they have generated, what steps they will take to solve the problem, and why they chose those steps.

4. Content Skills: Skill Checklist

Objective: To determine if students are able to use science equipment properly

In the first quarter of the year, the physical science teacher introduces the class to various scientific instruments that will be used in experiments throughout the year. During this time, the teacher maintains a skills checklist for each student. (See Figure 3 for some sample items.) As the students use the equipment in class, the teacher records the date and his/her evaluation of the student's ability.

5. Content Skills: Student Self Evaluation

Objective: To measure the ability to perform mathematical computations

FIGURE 3
Science Equipment Skills Checklist
(Sample)

| | Mastery of skill | Needs assistance | Unable to do |
|------------------------------|------------------|------------------|--------------|
| 1. Read a graduated cylinder | | | 9/16 |
| 2. Use a pipette | 9/10 | | |
| 3. Read a metric ruler | 9/13 | 9/10 | |
| 4. Read a thermometer | | | |
| 5. Use a balance | | | |

At the beginning of the school year, the teacher in an ESL math class decides to give students a checklist to report their computation skills. (See Figure 4 for some sample items.) The teacher plans to use this checklist as a diagnostic assessment tool along with other measures, such as a placement test, to guide whole class, small group, and individual instruction for the first quarter. To help some students, the teacher reads the checklist aloud as the students fill it out.

6. Concept Comprehension: Portfolios

Objective: I o assess student knowledge of ways protest has influenced social change

One objective of a U.S. history class is to recognize the role of protest in engendering change in society, such as legislation or revolution. In the third quarter of the year, the teacher asks students to prepare a portfolio that demonstrates their awareness of different types of protest and their subsequent results. Students are required to collect newspaper clippings of current events and comment on the protests described. They are encouraged to analyze the motives behind the protests and make predictions about resulting future change, drawing on historical comparisons.

FIGURE 4
Student Self-Evaluation Checklist
(Sample)

| | YES | NO | SOMETIMES |
|---------------------------------------|-----|----|-----------|
| I can add a column of four numbers. | | | |
| I can multiply two-digit numbers. | | | |
| I can divide by a three-digit number. | | | |
| I can add fractions. | | | |
| I can divide fractions. | | | |
| I can change a percent to a decimal. | | | |

To accommodate different language abilities, the teacher allows the students to write their comments or record them on audiotape to include in the portfolio. At the end of the quarter, the teacher will review the portfolios, looking for student historical knowledge and conceptual comprehension.

7. Concept Comprehension: Performance

Objective: To measure student ability to distinguish between regular and irregular polygons

In a geometry class, the teacher distributes paper, scissors, yarn, and several geoboards. Because the teacher wants to minimize the language barrier that might interfere with the students' performance, the teacher provides written and oral instructions for each task. Beginning with the paper and scissors, students are instructed to cut out geometric shapes, such as an isosceles triangle, an irregular pentagon, and a circle. Next, they are told to create a square, a rectangle, and an irregular six-sided figure with their geoboards and yarn. Scanning the room, the teacher can quickly assess the students' comprehension of these polygons.

8. Language Use: Checklist

Objective: To determine student familiarity with synonymous terms for mathematical operations

The pre-algebra teacher has drawn up a checklist of terms that s/he would like the class to know for the operations of addition, subtraction, multiplication, and division. To determine if they can link the terms to the symbols, the teacher designs a paired activity based on a technique in the Pre-Algebra Lexicon (Hayden & Cuevas, 1990). One partner receives a sheet with the operational symbols, the other the terms in verbal mathematical expressions (see Figure 5). The partner with the expressions reads them aloud. The other partner circles the correct symbol for the operation. In reviewing the worksheets, the teacher indicates on her checklist the terms students know and do not know.

9. Language Use: Oral Presentation

Objective: To measure student knowledge of key vocabulary terms, question formation, and sentence structure

In an elementary-level family life course, students have been studying hygiene. Their assignment has been to interview family members and neighbors about their dental hygiene habits and prepare an oral presentation of their findings.

FIGURE 5
Vocabulary in Mathematics Operations

| | | | | |
|--|--|---|---|---|
| Partner A: Read the Expressions below to your partner. | Partner B Circle the symbol of the operation you hear. | | | |
| Expression | Operation | | | |
| 1. Thirty minus eleven | + | - | x | / |
| 2. Sixty-five times two | + | - | x | / |
| 3. The quotient of sixty-four and eight | + | - | x | / |
| 4. One less than ninety-six | + | - | x | / |
| 5. Four increased by eighteen | + | - | x | / |
| 6. One third of twenty seven | | | | |

The teacher has encouraged them to prepare some charts or graphs to share. During the presentation, the students are expected to relate their interview questions, the subjects' responses, and their conclusions about dental hygiene habits. While they present, the teacher listens for key terms and grammatical questions and answers.

10. Communication: Portfolios

Objective: To evaluate student knowledge of genetics through several modes of communication

The high school biology class began a unit on genetics recently. On the first day, the teacher distributes a K-W-L chart and had the students fill in the What I *Know* about genetics and the What I *Want* to Learn sections. (The final section, What I *Learned*, will be part of a portfolio.) Based on what students put in their charts, the teacher generates a list of objectives for the portfolio. Three days later the teacher explains the portfolio procedure that would be used over the next 4 weeks and the list of items to include. (See Figure 6.) The teacher explains that students should begin working on the items and emphasizes that the objective is to see if students can create a portfolio that communicates the knowledge they have acquired about genetics.

11. Communication: Written Essays

Objective: To determine student ability to write a persuasive letter about a community issue

In a civics class, students read a hypothetical newspaper article about the county government's decision to allow a local developer to raze some old apartment buildings and build expensive, single family homes and a small shopping center.

FIGURE 6 Genetics Portfolio Assignment

A. For your Genetics Portfolio, please include the following six items.

1. Design a tree diagram tracing the genetic history of eye color in your family for three generations.
2. Write a prediction and explanation for your child's eye color if your spouse has gray eyes.
3. Explain the difference between fraternal and identical twins. Draw pictures to illustrate the difference.
4. Select one lab report from the genetics experiments we conduct in class. Explain how the experiment increased your knowledge of genetics.
5. Write a dialogue between two or three people discussing a genetic disease.
6. Complete the What I Learned section on your K-W-L chart for the genetics unit and include it in your portfolio.

B. Choose two additional items to show me what you know about genetics.

The article explains that the low-income building housed poor families but was in disrepair. Students are then instructed to take a position for or against the development plan and write a letter to the county government or to the newspaper outlining their position and making recommendations.

12. Individual Behavior: Anecdotal Record

Objective: To measure student ability to conduct research

The middle school language arts teacher has been focusing on research study skills in class. The teacher has

introduced students to the library and reviewed the process for conducting research, including generating a research question. Each student has reflected on a piece of literature previously read in class and comes up with a question he or she would like to answer, perhaps about the historical background of the story. While the students conduct their research, the teacher records vignettes of student actions. The teacher notes if students use the card catalogue, if they consult with the librarian for additional sources, if they make note cards, and so forth. At the end of the research activity, the teacher will have some insight into which individuals are able to conduct research and which need more practice in the process.

13. Individual Behavior: Performance

Objective: To determine student knowledge of the scientific observation process

At the conclusion of a unit on the senses, during which groups of students conducted several experiments, students work individually on a lab practical to demonstrate their observation skills. Each student is given water, clear plastic or glass cups, and colored, nontoxic fizzy tablets. They are told to place the tablets in water, observe what happens, and then write down their observations. The teacher will give credit for observations that were accurate and used sensory methods such as sight, taste, smell, and hearing.(3)

14. Group Behavior: Student Evaluation

Objective: T o use social skills during group tasks

After a week-long social studies project that resulted in a group presentation on several inventions designed during the Industrial Revolution and their impact on the students' lives today, the teacher distributes a group evaluation sheet to the students. (See sample items in Figure 7.) T hey are asked to complete it individually at first and then meet with the group to resolve any differences among group members.

15. Group Behavior: Reports

Objective: To evaluate students' abilities to work in a group to prepare an oral presentation

In the second semester of the year, small groups of elementary school students are assigned the task of studying one class of animal (e.g., reptile, fish, bird) and preparing an oral report.

FIGURE 7
Group Evaluation Form
(Sample)

Please respond to the following statements. (circle A for *All*. M for *Most*, S for *Some*, and N for *None*

| | All | Most | Some | None |
|---|-----|------|------|------|
| How many members brainstormed ideas for the report? | A | M | S | N |
| How many members followed his/her assigned role? | A | M | S | N |
| How many members prepared the final report? | A | M | S | N |
| How many members praised the ideas of the others? | A | M | S | N |

How many members stayed on task during class most of the time? A M S N

These students had participated in cooperative learning activities previously. To facilitate the first phase of the process, the teacher asks each student to research a different representative animal and share that knowledge with group mates. In the second phase, the teacher suggests the students choose roles such as illustrator, recorder, reporter, and so forth. The students are expected to prepare and present the report collaboratively. During the class time devoted to the project, the teacher evaluates the group process and notes whether (a) all the students participated, (b) they stayed on task, (c) they pooled their information, (d) they selected roles and followed them, and (e) their final report was a balanced representation of their work.

16. Attitude: Reading Inventory

Objective: To determine student attitude toward an instructional technique that promotes reading

In a language arts class with LEP students, the teacher uses sustained silent reading (SSR) twice a week. To determine student attitude towards this reading activity, the teacher may use a reading inventory such as the REACH scale in Figure 8. (See Hamayan & Pflieger, 1987, for a full discussion.) The dimensions most revealing about student attitudes are E (Enthusiastic about SSR), A (Attentive and on task during the activity), and C (easily Choosing books to read).

17. Attitude: Interview

Objective: To assess student recognition of the role of geography in society

World geography has been an elective course in one high school but became required for graduation this year. Anticipating discontent among the seniors forced to take the course, the teacher decides to conduct group interviews. Within the first 2 weeks of school, the teacher asks small groups of students their feelings about the geography course, their knowledge of other countries' natural resources and land features, and geography's importance in their lives now and in the future. At the end of the course, the teacher asks the students similar questions to determine if their attitudes have changed and whether the teaching has been successful in helping students gain an appreciation of geography.

FIGURE 8
Evaluating SSR Performance
(The REACH(a,b) Scale)

| Student Name | Week of: | | | | | Week of: | | | | | Week of: | | | | | Week of: | | | | |
|-----------------|----------|---|---|---|---|----------|---|---|---|---|----------|---|---|---|---|----------|---|---|---|---|
| | R | E | A | C | H | R | E | A | C | H | R | E | A | C | H | R | E | A | C | H |
| 1 | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | |

3

4

5

6

7

8

9

10

(a) Dimensions

R = Reading orally

E = Enthusiastic

A = Attentive

C = Choosing books easily

H = How many books read

(b) Rate the REACH dimensions along the following scale:

1 = Not able to/not at all

2 = Adequate

3 = Very well/very much so

NA = Not applicable

DISCUSSION

It is unlikely (and unnecessary) for all cells of the matrix to be filled during any one curricular unit or course. The matrix should be used to display the distribution of alternative assessment practices and the objectives teachers have measured. By keeping track of the filled-in cells, teachers can gauge their efforts at meeting the learning and testing styles of students and make adjustments if the choice of assessment measures has been unbalanced--all content skill measures or all written reports, for example.

The suggested assessment tools allow for oral, written, pictorial, and physical demonstrations of knowledge on the part of the students. They also balance control and responsibility for assessment outcomes between teachers and students. The checklists and observations are informal and teacher controlled; students need not know they are being assessed. The interview process incorporates opportunities for clarification and probing by both the teacher and the students. The other tools are student controlled. Students make their own decisions about the amount of effort they expend to complete the tasks.

Teachers may want to use measures for assessing students beyond those described in the matrix. Journals, profiles, reading logs, and simulations, for instance, may be substituted in the columns or added to the matrix. The increasing use of multimedia technology in the language classroom offers additional avenues for assessment. Video and audiocassette tapes, which may be made at regular intervals and preserved, can

capture student oral language development as well as growth of content knowledge. Computers, with tracking and branching capabilities, can individualize student assessment and monitor student progress. Computer simulations with interactive screen and audio components can engender assessment designs that measure all four language skills, problem solving, mastery of content objectives, and more.

The framework recommended in this article involves a time-consuming process. In setting up and implementing the matrix, teachers have to plan ahead and delineate their assessment objectives as they teach because assessment should be linked closely to instruction. Flexibility is important and insight into student learning styles is crucial. In some instances, teachers will need guidance in evaluating some of the measures. Scoring a portfolio or performance based task, for example, often requires listing criteria and developing a rating scale in advance. Furthermore, because some administrators and funding authorities prefer quantitative data when making program decisions, teachers should be aware that these individuals may need some training in interpreting the information some of these qualitative assessment tools reveal.

CONCLUSIONS

We must always remember that in integrated language and content courses we are doubly burdening our students. We are demanding that they learn enough English- academic English--to be mainstreamed and that they receive, process, and retain content information, much of which will be unfamiliar in terms of their prior schooling and life experiences. But, we have little choice. Time and interest take their toll on our students' educational careers: time because many students do not have 5-7 years to master English before approaching a content course in the U.S. educational system; interest because a grammar-based curriculum is not particularly appealing to a student who wants to fit into the school environment.

Our profession, therefore, has accepted the integration of language and content as an approach to assisting students with limited English proficiency. No approach is without drawbacks, and even if assessment is the weak link in the integrated language and content approach, the framework offered in this paper aims to strengthen that aspect of instructional practice. Clearly, some standardized tests and paper-and pencil chapter tests will continue to be used, but they are no longer satisfactory as the sole measures of student achievement.

After all, at the heart of instruction is the desire to help our language minority students learn, and at the heart of assessment is the need to determine whether our students have learned. We must assist them in that process by trying new alternatives that are not so language bound, time restrictive, or autonomous. Further, we must advocate assessment practices that mirror instructional practices. Let us focus on our students' strengths and give them opportunities to demonstrate ability, skill, and knowledge through the medium that suits them best, whether oral or written or even, in the case of beginner students, pictorial. Let us familiarize them in advance with the assessment measures and give them adequate time to complete the tasks. Let us help them take some responsibility for their own evaluation, especially through tools such as student checklists, reports, and portfolios. Let us become alternative assessment advocates for our language minority students.

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THE AUTHOR

Deborah J. Short is Associate Division Director for ESL at the Center for Applied Linguistics. She is interested in the integration of language and content and has conducted research and teacher preparation in that area. She also develops integrated curricula and materials.

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(1) Teacher resources include, among others, Brinton, Snow, & Wesche, 1989, Cantoni-Harvey, 1987; Crandall, 1987; Mohan, 1986; and Short, 1991. Student textbooks include, among others, Chamot, O'Malley, & Kupper, 1992; Crandall, Dale, Rhodes, & Spanos, 1989; Fathman & Quinn, 1989; Johnston & Johnston, 1990; and Short, Seutert-Bosco, & Grognet, 1991.

(2) In a whole language classroom, children who are learning to read and write are encouraged to write

before they have mastered spelling. They often write words based on the sounds they hear and, through pictures and reading aloud, they share their intent with the audience. Some educators refer to this process as invented spelling. I prefer the expression intended spelling to acknowledge that students are not just combining letters in any order but rather are making progress toward the actual spelling.

(3) This example is derived from an item on the international performance assessment conducted by the Center for Assessment of Educational Progress. See Semple, 1992.

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